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Recycled plastic waste to oil conversion technology: A complement to plastic recycling – industry survey and trends by 2024.

Transparency Market Research

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Economic growth and change in consumption and production pattern resulted into increase of plastic waste which leads to remarkable impact on environment. Plastic now have become a crucial material and the demand of this is increasing because of its durability, low cost, and diverse applications in industries and households. Growing amount of solid waste globally and the requirement for its removal have created an apprehension regarding the environmental health and economic issues. Waste plastic represents the large fraction of the total waste generated worldwide. Plastic materials are highly durable but requires long period of time for degradation due to their strong molecular bonds that make it resistant to natural processes of degradation. Every year approx. 500 billion pounds of plastic is manufactured. In many countries the process of recycling plastic has been carried out from last several years. Additionally, Ministry of Environment (MOE) have stringent the waste disposal law for industrial sector and many other sectors.

Some of the key segments of plastic recycling into oil market constitute several technologies such as pyrolysis/thermal degradation, catalytic degradation and gasification. Pyrolysis is a thermal degradation process that takes place in absence of oxygen in a closed cylindrical chamber. The plastic is pyrolysed at 370 to 420 degree Celsius. In this process the volume of the waste can be reduced substantially and it is an economical process to convert plastic into oil. In the catalyst degradation process a suitable catalyst is used to carry out a cracking process. Presence of catalyst lowers the temperature and the time required for the reaction. Catalyst can be reused in the process that makes this process cost effective and reduce adverse environmental impacts. Gasification process is a thermo-chemical conversion of the solid carbon based molecules into a combustible product. Gasification process can be used as a substitute for the conventional processes to convert plastics into fuels such as incineration process. If you burn pure hydrocarbons, such as polypropylene (PP) and polyethylene (PE) it will produce a clean burning fuel. But burning large amounts of chlorine and PVC will damage the reactor and lead to environmental pollution. Polyethylene terephthalate (PETE) is best to recycle as it produce oxygen while burning into oxygen deprived chamber which leads to slowing the process.

Global plastic to oil market can also be segmented on the basis of the types of waste generated such as domestic and industrial waste. Domestic waste will contain mainly of the waste emitted by households.

However it also consists of some business waste produced by restaurants, packaging of household goods, bottles, plastic bags. Bottles are made from a single type of plastic and it is easier to sort out and process it. Household plastic waste is relatively easier and cheaper than industrial plastic waste to process and produce oil out of it as it requires less effort in sorting and cleaning.

China and Japan are some of the major countries in Asia Pacific that have initiated recycling process on a commercial level. The plastic waste material is sent to China from many countries such as India, Australia and many others for the recycling. North America, Latin America, Africa and China are some of the largest plastic waste producers in the world. Therefore, the scope of development for recycling of plastics into oil is more in these regions.

Growing population and increasing energy demand is one of the primary drivers for plastic to fuel market. Many governmental policies created for recycling and reusing of plastic materials are expected to foster the growth of this market in coming years. Recycling of plastic requires majorly the sorting of the waste into different kind of plastics, hence it is labor intensive which results in high production cost. This can act as a restraint for plastic to oil market. However many machines are being developed that sorts with laser techniques and can differentiate between different types of plastic materials.

Some of the major players in recycling of plastic to oil market are Polymer Solutions, Cynar Plc, Plastic2Oil Technologies, Agilyx, VentanaEcogreen Inc. and PK Clean.

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